METRULOGY



EASILY QUICKLY ACCURATELY



Innovation Design R&D Patented Technology Award

# SAVE Time & Cost Improve the efficiency & accuracy

**INSTRUMENT** 

METROLOG

METRULOGY



> METR OLOGY. All new Image Measuring Instrument Top Series come with new innovative design in structural quality, functionality, and accuracy, a total upgrade to satisfy your upmost demand.

- IMI-TOP series, The whole machine granite structure design, better performance, longer life, a new generation of humanized measurement software, stronger functions and higher precision, precision optical measuring instruments made with the combination of precision mechanics, electronics, and optical measuring systems.
- Best suitable for precision manufacturing industries such as the following: Molding, machining parts, tools, screws, gears, automobiles, watches, machines, aerospace parts, semi-conductor, rubber, plastic, auto lathe machining, precision spring, and etc.
- > IMI-TOP series is great for design & development, QC inspections, and educational purpose in schools.
- IMI-TOP series is design specifically to measure length, angles, radius, points, line, circle, distance, and other 2D/3D geometric element measuring requirements. Magnified projection image for inspection and comparison of the workpiece contour and surface shape.
- IMI-TOP series machine structure are made with combination of precision granite parts, linear or roller bearings slide, high precision linear scale, high resolution lens, color camera, image measuring software. The exceptional quality is your number 1 choice for workshop inspection and QC department examination.



# METRULOGY

# Hardware Structure Description



# TOP Series Unbeatable precision combination Innovation Design R&D Patented Technology Award



XY-axis granite table & base





Arm-type granite Z-axis column Integrated motion control card



Precision linear roller guide



Non-threaded screw fastener



Precision ball screw drive



Smart control servo motor



Zoom magnification optical lens and 3D touch probe



Low friction and noiseless energy chain



Gigabit network million pixel color industrial camera



High precision linear scale



Programmable surface light source with four rings and eight sections

METROLOGY



#### **Technical specification**

Model No.	Measuring Range (XY)
IMI-T100	100*100mm
IMI-T200	200*100mm

Resolution : 0.001mm/0.00005" (X-Y axis high accuracy linear scale) Measuring Accuracy : ±(3+L/200) µm (X, Y Axis)

Main structure: Granite base, 2D measurement software, 360° rotating table (IMI-T100) Metal base & body, 2D measurement software (IMI-T200)

Transmission system: 2-axis cross linear ball slide and toothless screw drive module Image system: 1/3" 0.41M pixels high resolution CCD color camera

Image magnification: 25X-250X, Z-axis adjustable focusing distance 90mm

Focusing device: Z-axis manual transmission module handwheel, 75mm adjustment of focus Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Illumination system: High brightness adjustable LED surface and transmission parallel light Computer system: Computer with 21.5" LCD color monitor, keyboard, mouse

Software system: Jingstone Metrology 2.5D image measuring system.

Measuring result output: Word, Excel, TXT, DXF, SPC

Standard Accessories: calibration plate, measurement software, dongle, operation manual



### **IMI-P Series (Practical)**

Model No.	Measuring Range (XYZ)
IMI-P200	200*100*150mm
IMI-P300	300*200*150mm
IMI-P400	400*300*200mm
IMI-P500	500*400*200mm

\*Z axis height can be customized according to requirements



Innovation Design R&D Patented Technology Award

Ô

## **Technical specification**

Resolution : 0.001mm/0.00005" (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm$ (3+L/200) µm (X, Y Axis)

Main structure: XY-axis DIN 00 grade granite measuring table & Z axis arm type granite column Transmission system: 3-axis cross linear ball slide and toothless screw drive module Image system: 1/3″ 0.41M pixels high resolution CCD color camera

Image magnification: 25X-250X

Focusing device: Z-axis transmission module handwheel, manual adjustment of image focus Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Illumination system: High brightness adjustable LED surface and transmission parallel light Computer system: Computer with 21.5" LCD color monitor, keyboard, mouse

Software system: Jingstone Metrology 2.5D image measuring system.

Measuring result output: Word, Excel, TXT, DXF, SPC

Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop

METRULOGY

0

#### **IMI-AF Series (Autofocus)**



Innovation Design R&D Patented Technology Award

Model No.	Measuring Range (XYZ)
IMI-AF200	200*100*150mm
IMI-AF300	300*200*150mm
IMI-AF400	400*300*200mm
IMI-AF500	500*400*200mm

\*Z axis height can be customized according to requirements



**Z-axis** Controller

#### **Technical specification**

Resolution : 0.001mm/0.0005" (X-Y-Z axis high accuracy linear scale) Measuring Accuracy : ±(3+L/200) µm (X, Y Axis) Main structure: XY-axis DIN 00 grade granite measuring table & Z axis arm type granite column Transmission system: 3-axis cross linear ball slide and toothless screw drive module Electronic system: Z-axis AC servo motor speed control system and controller Image system: 1/3" 0.41M pixels high resolution CCD color camera Image magnification: 25X-250X Focus system: Z axis electric motor & software autofocus system Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens. Illumination system: High brightness adjustable LED surface and transmission parallel light Computer system: Computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D image measuring system. Measuring result output: Word, Excel, TXT, DXF, SPC Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop

#### **INSTRUMENT**



# Image Measuring Instrument IMI-AF-P Series (Autofocus+Probe)

0



3D touch probe



Innovation Design R&D Patented Technology Award

Model No.	Measuring Range (XYZ)
IMI-AF200P	200*100*150mm
IMI-AF300P	300*200*150mm
IMI-AF400P	400*300*200mm
IMI-AF500P	500*400*200mm

\*Z axis height can be customized according to requirements



**Z-axis** Controller

#### **Technical specification**

Resolution : 0.001mm/0.00005" (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm$ (3+L/200)  $\mu$ m (X, Y Axis) Main structure: XY-axis DIN 00 grade granite measuring table & Z axis arm type granite column Transmission system: 3-axis cross linear ball slide and toothless screw drive module Electronic system: Z-axis AC servo motor speed control system and controller Image system: 1/3" 0.41M pixels high resolution CCD color camera Image magnification: 25X-250X Focus system: Z axis electric motor & software autofocus system Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens. Illumination system: High brightness adjustable LED surface and transmission parallel light Probe system: Renishaw (U.K.) MCP touch trigger probe, setting ring and ruby tips. Computer system: Computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D/3D image & probe coaxial measuring system. Measuring result output: Word, Excel, TXT, DXF, SPC Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop

METRULOGY

Image Measuring Instrument
 IMI-CNC Series (CNC-Automatic)

Model No.	Measuring Range (XYZ)
IMI-CNC200	200*200*150mm
IMI-CNC300	300*200*150mm
IMI-CNC400	400*300*200mm
IMI-CNC500	500*400*200mm

\*Z axis height can be customized according to requirements



Innovation Design R&D Patented Technology Award



3-axis joystick controller

#### **Technical specification**

Resolution : 0.0005mm/0.00002'' (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm (2.5 + L/200) \mu m$  (X, Y Axis)

Main structure: XY-axis DIN 00 grade granite measuring table & Z axis arm type granite column Transmission system: 3-axis cross linear ball slide and toothless screw or ball screw drive module Control system: CNC automatic editing program measurement and 3-axis joystick controller Electronic system: 3-axis smart control servo motor and integrated motion control card Image system: Gigabit network high resolution million pixel color industrial camera Image magnification: 25X-250X

Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Focus system: Z axis electric motor & software autofocus system

Illumination system: Programmable surface light source with four rings and eight sections Computer system: Quad core computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D CNC CAD graphic image measuring software. Measuring result output: Word, Excel, TXT, DXF, SPC, IGES

Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop



# Image Measuring Instrument IMI-CNC-P Series (CNC+Probe)

Model No.	Measuring Range (XYZ)
IMI-CNC200P	200*200*150mm
IMI-CNC300P	300*200*150mm
IMI-CNC400P	400*300*200mm
IMI-CNC500P	500*400*200mm

\*Z axis height can be customized according to requirements



3D touch probe

# **Technical specification**



Innovation Design R&D Patented Technology Award

#### 3-axis joystick controller

Resolution : 0.0005mm/ $0.0002^{"}$  (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm (2.5 + L/200) \mu m$  (X, Y Axis)

Main structure: XY-axis DIN 00 grade granite measuring table & Z axis arm type granite column Transmission system: 3-axis cross linear ball slide and toothless screw or ball screw drive module Control system: CNC automatic editing program measurement and 3-axis joystick controller Electronic system: 3-axis smart control servo motor and integrated motion control card Image system: Gigabit network high resolution million pixel color industrial camera Image magnification: 25X-250X

Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Focus system: Z axis electric motor & software autofocus system

Illumination system: Programmable surface light source with four rings and eight sections Probe system: Renishaw (U.K.) MCP touch trigger probe, setting ring and ruby tips.

Computer system: Quad core computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D CNC CAD graphic image measuring software. & 3D image & probe coaxial measuring system.

Measuring result output: Word, Excel, TXT, DXF, SPC, IGES Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop

METRULOGY

Innovation Design R&D Patented Technology Award

Image Measuring Instrument
 IMI-CNC Series (CNC-Automatic)

#### Bridge type

Model No.	Measuring Range (XYZ)
IMI-CNC600	600*500*200mm
IMI-CNC800	800*600*200mm
IMI-CNC1000	800*1000*200mm
IMI-CNC1200	1000*1200*200mm
IMI-CNC1500	1000*1500*200mm
IMI-CNC2000	1500*2000*200mm

\*Z axis height can be customized according to requirements

#### **Technical specification**

3-axis joystick controller

Resolution : 0.0005mm/0.00002" (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm$ (3.5+L/200)  $\mu$ m (X, Y Axis)

METROLOGY

Main structure: DIN 00 grade XZ axis bridge type granite column & Y-axis measuring stand Transmission system: 3-axis high precision linear slide & ball screw drive module Control system: CNC automatic editing program measurement and 3-axis joystick controller Electronic system: 3-axis smart control servo motor and integrated motion control card Image system: Gigabit network high resolution million pixel color industrial camera Image magnification: 25X-250X

Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Focus system: Z axis electric motor & software autofocus system

Illumination system: Programmable surface light source with four rings and eight sections Computer system: Quad core computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D CNC CAD graphic image measuring software. Measuring result output: Word, Excel, TXT, DXF, SPC, IGES

Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop





## **Technical specification**

3-axis joystick controller

Resolution : 0.0005mm/0.00002" (X-Y-Z axis high accuracy linear scale) Measuring Accuracy :  $\pm$ (3.5+L/200) µm (X, Y Axis)

Main structure: DIN 00 grade XZ axis bridge type granite column & Y-axis measuring stand Transmission system: 3-axis high precision linear slide & ball screw drive module Control system: CNC automatic editing program measurement and 3-axis joystick controller Electronic system: 3-axis smart control servo motor and integrated motion control card Image system: Gigabit network high resolution million pixel color industrial camera Image magnification: 25X-250X

Optical system: 0.7-4.5X continuous zoom ultra-low distortion optic lens.

Focus system: Z axis electric motor & software autofocus system

Illumination system: Programmable surface light source with four rings and eight sections Probe system: Renishaw (U.K.) MCP touch trigger probe, setting ring and ruby tips. Computer system: Quad core computer with 21.5" LCD color monitor, keyboard, mouse Software system: Jingstone Metrology 2.5D CNC CAD graphic image measuring software. & 3D image & probe coaxial measuring system.

Measuring result output: Word, Excel, TXT, DXF, SPC, IGES Standard Accessories: calibration plate, measurement software, dongle, operation manual Optional Accessories: Steel instrument working table cover with OA desktop

METRULOGY



Jingstone metrology 2.5D/3D image measuring software Patented Technology Award









#### Jingstone metrology 2.5D/3D image measuring software Patented

JINGSTONE METROLOGY 2.5D/3D image measurement software has a simple interface, intuitive operation, easy to use, and powerful functions. It can quickly and efficiently complete the measurement element requirements and accurate measurement results.

#### 1 Simple and friendly interface

Put the main and commonly used functions on the main interface, which is easy to be familiar with. The operator can complete almost all measurement actions by simply clicking and dragging the mouse.



## 2 Powerful geometric measurement function

## 1. Complete geometric measurement function

#### **Element measurement:**

Elements include the point, line, circle, arc, ellipse, rectangle, slot, ring, open curve, closed curve and the other geometric elements.

When the Z-axis adds electronic probes or laser displacement sensors and other equipment, 3D graphic elements such as cylinders, cones, spheres, and surfaces in 3D space can also be measured.

According to the actual characteristics of the element, each element can be measured in a variety of different methods. After the point or edge finding measurement is completed, the coordinate value, length, area, volume and other information of the element can be directly obtained.



METROLOGY



Measurement methods:

Extracting the closest point to the mouse cursor



Extracting a straight line by capturing Multiple segments



Extracting a circle by capturing the entire boudary



Extracting a ring by capturing the entire boudary



Extracting a circle by capturing Multiple segments

Measuring an

open curve



Innovation Design R&D Patented Technology Award



Extracting an ellipse by capturing the entire boudary



Measuring a closed curve

Extracting a rectangle by

capturing the

entire boudary



Extracting a slot by capturing the entire boudary

2. Powerful edge finding function

It can capture the weak edges of the image, and can set the direction of edge finding arbitrarily to avoid edge finding errors, set edge finding parameters flexibly, and remove the influence of noise and burrs.



3. Image focus function

Manual focus: only need to move the Z-axis handwheel to adjust the focus, eye observation to determine the clearest state of the image

Autofocus: The Z-axis electronic motor speed control system, manipulator and software automatically determine the clearest state of the focused image

The above functions can be used to measure height, depth and flatness.



Rotate the light section

Contour light area

Surface light area

Lighting mode

XY-axis movement is con-

trolled by these 4 arrows Click on 4 blank areas of the

diagonal to control the oblique

#### 3 . Light source supporting various lighting modes

When the instrument is equipped with the corresponding light source to support various lighting modes, a variety of light source adjustment functions can be realized The adjustment mode of light sources such as multi-ring and multi-segment surface light, contour parallel light, coaxial light, etc.

0 😚 🍪

106

OFF



1. The measuring table can be moved by commands in the motion control area.

 $(\mathbf{0})$ 

direction movement XY-axis movement speed adjustment scroll bar The jog checkbox 2. The way of motion control area: motion control 3-axis movement, image area XY axis

2. The way of motion control area: motion control 3-axis movement, image area XY axis movement in any direction, fixed coordinate point 3-axis distance movement, element center movement, jog coordinate axis movement, map navigation fast positioning movement

#### 5 • Pixel calibration function

- 1. Definition: Pixel calibration refers to establishing the correspondence between the pixel size of the computer display and the actual size.
- 2. Pixel calibration type : Four circles calibration (Applicable to movable XY measuring table)
   One circle calibration (Applicable to the worktable cannot be moved or does not contain

an optical scale)





Pixel calibration management



Patented Technology Award

Laser indicator Checkbox

coaxial light

by these 2 arrows

Z axis movement is controlled

Z-axis movement speed

Brightness adjustment scroll bar

METROLOGY



METRULOGY



#### 6 • Dimensioning of graphic elements

Elements can be dimensioned, rotated, enlarged, and hidden in CAD mode through the

graphics toolbar



#### 7 . Element construction and preset

Element construction : According to different elements, the construction methods includes extraction, intersecting, tangent, vertical, parallel, mirror, translation, composition, symmetry and so on.

Element Presetting : The software supports to preset the point, line, circle, plane, cylinder, cone, and sphere. Element preseting is also mainly used in some auxiliary measurements or comparative measurements.

#### 8 . Definition of the coordinate system

Use right-hand cartesian coordinates, divided into mechanical coordinate system and workpiece coordinate system



3. Steps to create a workpiece coordinate system

L72

## Introduction of measuring software for image measuring instrument

# 9 • Measurement of complex shape workpieces and mass workpieces

1. The elements translation and matrix

For feature elements arranged equidistantly, only one element needs to be measured, and the measurement of all elements can be automatically completed by the translation array function, which is very convenient to measure array features.

#### 2. The fixture array and the macro array

When measuring a large number of workpieces, you only need to measure one workpiece, and the workpiece array and array macro function can automatically complete the measurement of all workpieces. No matter a single fixture or multiple fixtures can handle it at the same time, it saves time and improves measurement efficiency.

# 3. Comparative measurement with the CAD drawing

CAD software can be used to draw dimensional drawings directly, and automatic measurement can be realized after importing the software, without the need to pick points to find edges, which is very convenient for coordinate measurement and contour comparison measurement of complex or irregular shapes.

CAD graphics display supports DXF format 2D file import and export and IGES format file export. CAD graphics output can be used for reverse engineering









METRULOGY



4. The comparative measurement toolbar

The scale line, angle line and standard circle can be preset to compare and measure the workpiece. You can also directly pull the dimension line or angle line on the image contour to dynamically observe the length, angle, step height, diameter and other dimensions of the workpiece.



Quick angle observation





measurement toolbar



Distance from a line to points

5. Map navigation function with quick positioning of local features

The software function can be used to control the machine to scan the entire workpiece into a picture, and even directly import the picture of the workpiece obtained by taking pictures, and use the picture element point as the unit to accurately locate the workpiece. This function enables the machine to quickly and automatically locate any subtle local position, which is especially suitable for the positioning of large-size workpieces and the precise positioning of workpieces with a large number of similar features.





#### 10 · Flexible user program

1. The software automatically compiles the user program according to the user's measurement step sequence and control the operation and stop of the program.

2. The user program and each step can be edited, sorted, pinched in, and deleted to adapt to various complex and changeable measurement steps.

3. When measuring a large number of workpieces, only one edge-finding measurement is required to avoid repeated actions and save time and effort.



# METROGY

#### Introduction of measuring software for image measuring instrument



- 11 · Automatic calculation of geometric tolerances of elements Innovation Design R&D Patented Technology Award
- 1. The software provides complete tolerance setting and calculation functions, which can set and calculate geometric tolerances such as straightness, roundness, flatness, cylindricity, profile, position, parallelism, perpendicularity, concentricity, circular runout, etc. .
- 2. Click the element display area to view the measurement result data, including the measurement value, error value, upper tolerance, lower tolerance and status.
- 3. Tolerance can be set to automatically determine the status of the measurement result. When it is NG, it will be warned in red. Tolerance settings include upper and lower tolerances, shape tolerances, and position tolerances.
- 4. The visualized tolerance chart enables the user to know the specific out-of-tolerance position, which is convenient for finding out the reason.

CIR1	Ref Coordinate System : PCS1					
Content	Actual	Nominal	Over	UpTol	LowTol	State
Center X	2.119	2.119	0.000			
Center Y	-2.002	-2.002	0.000			
Diameter	2.001	2,100	-0.099	0.020	-0.020	NG
₽T	0.114	0.114	0.000			





#### 12 • Data report and graphic data export function

The software can export the result data in a variety of report formats, and can export the measurement result data to EXCEL, WORD, TXT, DXF, format reports, IGES file export and SPC statistical calculation analysis.



METROLOGY



Innovation Design R&D Patented Technology Award



Can export DXF and IGES format graphics data, graphics can be directly used in CAD reverse engineering.

#### 13 • Open peripheral connection function

The software supports connecting external devices such as probes, laser sensors, white light sensors, and manipulators, and can integrate these devices together to more accurately measure the height, depth and 3D size of the workpiece.





Innovation Design R&D

Patented Technology Award

#### Introduction of measuring software for image measuring instrument

#### 14 · 3D electronic probe measuring function

It can measure the 2D and 3D element features, such as the height, plane, cylinder, cone, ball, and ring. It supports 7 methods to build the 3D coordinate system, and also support the synchronization of the image measurement and the probe measurement.



#### 15 • Electronic probe styli calibration

can use the standard block gauge, standard sphere, or standard ring to calibrate the probe system.



Collect planes and points



Collect around the sphere and vertices



Collect the circumference

#### 16 · Practical measurement functions

- 1. The elements translation and matrix
- 2. Comparative measurement with the CAD drawing
- 3. The fixture array and the macro array
- 4. The scanning function for reverse engineering
- 5. Comparative measurement with auxiliary lines and rings
- 6. The comparative measurement toolbar

\*Please refer to the software operation manual for detailed function description of this measurement software









METRULOGY



- 1. User program file settings: create, open, save, compile, execute and modify
- 2. The Find-Edge-Tool settings : Light data, Find edge parameters, Auto focus

0	New(N)	0.0.	00	
1	Open(0)			
	Save(S)			
	Save as			
	Open Recently Program files			
	Open Fix			

IR1- Find Edge Tool tool1 • Mave To	😵 Light Data
<ul> <li>Light Data</li> <li>Find Edge Param</li> <li>Auto Focus</li> </ul>	Put current light data into this Find Edge Tool Apply with all Find Edge Tools in this element
	OK CANCEL AFTET (A)

3. User program settings : Speed of running < Find Edge delay < Export to EXCEL < Go to first element < Go to specifacation position

4. The "Goto Point" settings :

When moving from one element to the next element, the default movement trajectory is the shortest straight line between these two elements. The collision must occur if there is an obstacle between these two elements. So the Goto points must be set on the movement trajectory to avoid the collision. As shown below:



Goto point B Goto point C Goto point A Goto point D workpiece

Error: There are no Goto points

Correct: The Goto points have been inserted

5. Parameter settings :



Patented Technology Award